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THE UNIVERSITY OF ALBERTA

AN APPLICATION OF HOLLAND'S THEORY OF VOCATIONAL CHOICE TO A COLLEGE SAMPLE

by

© BERT WILLIAM GILES

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

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FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled AN APPLICATION OF HOLLAND'S THEORY OF VOCATIONAL CHOICE TO A COLLEGE SAMPLE submitted by BERT WILLIAM GILES in partial fulfilment of the requirements for the degree of MASTER OF EDUCATION.

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February 14, 1975

ABSTRACT

An aspect of John L. Holland's (1973) Theory of Personality Types and Model Environments was operationalized and tested through the Vocational Preference Inventory (V.P.I.) at Grant MacEwan Community College (G.M.C.C.).

Several programs of studies at G.M.C.C. were classified into Model Environments according to Holland's theory. The programs fell into six classifications: (a) Horsemanship (Realistic), (b) Behavioral Science (Investigative), (c) Nursing (Social), (d) Secretarial Science (Conventional), (e) Business Administration (Enterprising), and (f) Music (Artistic).

Relevant research revealed that the V.P.I. could measure Holland's six Personality Type dimensions within individuals.

It was postulated that if a G.M.C.C. program of studies was classified as a particular Model Environment according to Holland's theory, then the individuals within the program would exhibit the Personality Type profile demanded by the Environment. That is, the order of the V.P.I. measures should be congruent to the theoretical rank order demanded by the theory.

Further, it was suggested that the student body of the second year of studies, in each program, would have V.P.I. profiles more consistent with their respective Model Environment than the student body of the first year of studies of the same program.

Analysis of variance and Chi-square analysis were performed on the data gathered from the registrants of the six programs of study selected.

The results of the first question were satisfied at a probability level of less than .01 in all programs except Nursing (Social). Data from the Nursing (Social) program, classified according to Holland's theory, failed to support the suggestion. A suggestion was made that the theory may require periodic revision as occupational stereotype changes occur. It was concluded that these results, with the above mentioned exception, lend considerable support to Holland's theory.

Analysis of the data offered little, if any, support for the question of stereotype changes at various stages of occupational preparation. In fact, a significant difference at a probability level of less than .01 was found for only the Secretarial Science (Conventional) program of studies. No other significant differences were found, lending little support to the suggestion. A suggestion was made that the two-year program length was inadequate for such a change to appear.

Upon the evidence of the study, vocational counsellors at G.M.C.C. may find it useful to use a student's V.P.I. profile to enable the student and counsellor to gather relevant hints of personality correlates which may aid a vocationally unsure student to clarify himself vis-a-vis specific vocations.

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CHAPTER I

INTRODUCTION

THE PROBLEM

Vocational interests and choice have traditionally been treated as being different from or independent of personality. The work of Strong (1943), Super and Crites (1962), and Campbell (1971), exemplify this view. Holland (1973) argues, however, that vocational goals are an expression of the total person and not merely a separate interest of the individual.

Holland's theory of vocational choice attempts to identify major styles of life, or behavioral orientations, from which predictions may be made concerning career decisions. The theory is built on the assumption that there are six basic orientations to life and six corresponding work environments. Each individual behaves in a manner which reflects one of these styles more so than the others, thus giving rise to the individual's peculiar orientation to life. In other words, Holland's theory suggests that individuals tend to choose actual occupational environments consistent with their personal orientation. Studies by Baird (1970), Lacey (1971), and Folsom (1971) support this thesis.

Holland's theory lends itself to making predictions about the kinds of careers, or college majors that people in various categories would select. Existing evidence (Holland, 1962, 1968; Osipow,

Ashby and Wall, 1967) indicates that students tend to choose college major environments consistent with their personal orientations.

In light of this theory, and supporting evidence, it would seem reasonable to assume that students preparing for a particular occupation would have personalities consistent with those of the members of the intended occupation.

THE PURPOSE

The purpose of this present study is to explore the assumption that personality type and occupation are related to academic preparation. In particular, the study addresses itself to two primary questions:

1. Are the personalities of students preparing for a particular occupation consistent with those of the members of the intended occupation?

2. Are there differences in the personality patterns of the student body at various stages of their preparation?

The study attempts to answer these questions by obtaining the high point scores on the Vocational Preference Inventory from a sample of students enrolled at Grant MacEwan Community College. The data is tested for significant differences by the techniques of analysis of variance and Chi-square tests of differences.

CHAPTER II

REVIEW OF THE LITERATURE

This chapter is presented in three parts: the first dealing with the relationships of personality and vocational choice, the second with empirical research, and the third part dealing with personality change over time.

PERSONALITY AND VOCATIONAL CHOICE

Vocational interests and choice have traditionally been treated as being different from or independent of personality. Strong (1943), Super and Crites (1962), and Campbell (1971) argue that a person's score on vocational interest inventories and his choice of vocation are a function of his "vocational interests," which implies that these interests are different from or independent of personality. These vocational interests measure only interests, vocational choices, and vocational preferences.

Holland (1973), on the other hand, presents a more encompassing view arguing that vocational interests are an expression of personality. They represent the expression of personality in work, school subjects, and preferences. In other words, "vocational interests" are simply another aspect of personality. From this premise, Holland has constructed a theory of personality based on knowledge of vocational life. In turn, he has reinterpreted vocational interests as an expression of personality.

The Theory

The essence of Holland's theory can be summarized in four basic statements (Holland, 1973). Firstly, in our culture, most persons can be categorized as one of six personality types: Realistic (R), Investigative (I), Social (S), Conventional (C), Enterprising (E), or Artistic (A). The description of each type is a model against which we can measure an individual. Each type is the product of a characteristic interaction between a variety of cultural-personal forces, such as peers, parents, social class, culture, and the physical environment. As a result of these interactions, a person learns to prefer some activities as opposed to others. These activities result in strong interests, which lead to a group of competencies. Finally, a person's interests and competencies create a particular personal disposition that leads him to think, perceive, and act in unique ways.

Secondly, there are six kinds of environments: Realistic (R), Investigative (I), Social (S), Conventional (C), Enterprising (E), and Artistic (A). Each environment is dominated by a given personality type and each environment is typified by physical settings posing special problems and stresses. Because different personality types have different interests, competencies and dispositions, they tend to surround themselves with special people, and to seek out problems that are congruent with their interests, competencies, and outlook on the world. Thus, where people gather, they create an environment that reflects their personality type.

Thirdly, people search for environments that will let them exercise their skills and abilities, express their attitudes and values,

and take on agreeable problems and roles.

Fourthly, a person's behavior can be explained by the interaction of his personality and the characteristics of his environment. Thus, if we know a person's personality type and the type of his environment, we can predict some of the outcomes of this interaction. Such outcomes include vocational choice, vocational achievement, personal competence, and educational and social behavior.

On the basis of Holland's theory, it follows that Realistic types would be expected to seek out Realistic environments, while Social types would be expected to seek out Social environments, and so forth.

Occupational Stereotypes

Holland's theory rests upon the notion that ". . . most people view the vocational world in terms of occupational stereotypes." (Osipow, 1968, p. 39) For Holland, occupational stereotyping is an accurate reflection of personality. For example, if a person has had little contact with the job of teaching, he would evaluate his feelings about the job by his stereotype of the job and those in the job. It is likely that he would enter the job, other things being equal, if this stereotype resulted in positive and pleasant feelings.

We tend to judge people by their occupations; accountants are seen as precise, actors are self-centered, salesmen are persuasive. Although perceptions, based on experience, could be inaccurate, Marks and Webb (1969) find that students entering the fields of management or engineering possess a fairly accurate image of the typical incumbent of the intended occupations. These perceptions are validated by persons

in the respective occupations. Further, their study reveals that experience is not related to accurate perceptions of the intended occupation. In a similar study, O'Dowd and Beardslee (1967) demonstrate that occupations are perceived in similar fashion by high school students, college students and faculty, and men versus women. Their study indicates that these occupational stereotypes change only slightly over a four-year college term.

It therefore appears that interest inventories rely on the assumption that people perceive occupations accurately and that these perceptions remain stable over long periods of time. Moreover, since a person's vocational preferences and choices rest on these assumptions, it can be seen that the validity of an interest inventory rests with the validity of a person's perception of various occupations.

Interest Inventories as Personality Inventories

If it is accepted that vocational interests are an expression of personality, then it follows that interest inventories are personality inventories. Forer (1948) developed an inventory to assess personality from interests and activities by having subjects respond to neutral content such as vocational interests and activities. Utilizing various scales on the Kuder Preference Record, he was able to distinguish groups of asthmatics and schizophrenics. Thus, the scores on this interest inventory could be interpreted as expressions of personality dimensions.

Supported by Forer's findings, Holland (1958, 1965) constructed the Vocational Preference Inventory (V.P.I.), a personality inventory composed entirely of occupational titles. Holland's rationale for the

development of the inventory rested upon his previous theory. He states, "The choice of an occupation is an expressive act which reflects the person's motivation, knowledge, personality, and ability. Occupations represent a way of life, an environment rather than a set of isolated work functions or skills," (Holland, 1973, p. 7). Thus, it can be seen that Holland's Vocational Preference Inventory is simply an operationalization of his theory of vocational choice.

The Vocational Preference Inventory (V.P.I.)

The Vocational Preference Inventory (1965), is a personality and interest inventory composed of 160 occupational titles. To respond, a student checks each title as being a desirable or undesirable occupation. The inventory is composed of eleven scales: Realistic, Investigative, Social, Conventional, Enterprising, Artistic, Self-control, Masculinity, Status, Infrequency, and Acquiescence. The first six scales represent the personal orientations, while the other five scales provide a means of evaluating the subject's test-taking consistency. The Self-control scale reflects the degree of spontaneity in living; the Masculinity scale indicates occupational roles identified with males and females; the Status scale indicates vocational choices in terms of prestige ranking; the Infrequency scale, actually a Social Desirability scale, indicates the subject's choices in terms of typical and popular likes and dislikes; the Acquiescence scale, a fakeability scale, detects dissimulation and extreme response biases. Although the V.P.I. Manual suggests that all eleven scales should be considered in individual interpretation, the present study utilized the latter five scales solely as "consistency measures" in determining the legitimacy of each student's profile scores. In other words, each profile was examined for consistency

in responses via all scales and then either accepted or rejected as legitimate data for the purposes of this study. This method was felt to be acceptable, as the present study is concerned with group responses only on the six orientation scales.

Each of the six personal orientation scales yields a score from 0 to 14. From this, Holland obtains a profile of the student in terms of the ranking of the six personality categories. The higher a person's score on a scale, the greater his resemblance to the type that scale represents. His highest score represents his personality "type," his profile of scores (obtained by ranking the scale scores from highest to lowest) represents his personality "pattern." Thus, a profile of resemblance is obtained that allows for the complexity of personality and avoids some of the problems inherent in categorizing a person as a single type. In fact, this six-category scheme allows simple ordering of a person's resemblance to each of the six models to provide the possibility of 720 different personality patterns.

The 1966 revision of Holland's theory was followed by "A Psychological Classification Scheme for Vocations and Major Fields," (Holland, 1966) which is described as ". . . empirically and theoretically based, and it follows the logical principles of classification." (Holland, 1966, p. 278) Of interest is the methodology that:

> Average V.P.I. profiles, using Realistic, Investigative, Social, Conventional, Enterprising, and Artistic scales were calculated for the students aspiring to each vocation. Vocations were assigned first to one of six vocational classes (Realistic, etc.) depending upon the highest average V.P.I. scale obtained by its aspirants (Holland, 1966, p. 280).

This classification scheme was part of a developmental process that took place from 1959 to 1972, leading up to the present "Occupations Finder" (Holland, 1973). The latter is a list of some 50,000+ occupations, classified according to Holland's six main categories, with each main category divided into sub-categories (defined by personality patterns). The development of this classification system was a long and involved process. For a detailed explanation of this process and its validation, the reader is directed to Abe and Holland (1965), Holland, Whiteney, Cole and Richards (1969), Campbell (1971), and McCormick, Mecham and Jeanneret (1969).

EMPIRICAL RESEARCH

The underlying tenants of Holland's theory have been criticized by Isaacson (1967) on the grounds that they represent an oversimplification of the process of vocational development. Carkhuff, Alexik, and Anderson (1967) indicate that Holland's framework does not meet the criteria of a true "theory".

Nevertheless, recent findings have tended to support Holland's theoretical constructs. In one of his first studies, Holland (1962) sampled National Merit finalists over one- and two-year intervals. Using V.P.I. scale scores, vocational choice, or choice of field of study to define a student's type, he reports a broad range of personal characteristics are associated with the types. In a follow-up study, Holland (1963) assessed National Merit finalists over a four-year period, using six scales of the Strong Vocational Interest Blank (S.V.I.B.). As well, he defined the students' resemblance to the types by such dependent variables as choice of vocation, major field of study, and self-ratings.

His findings support those of his 1962 study, but further, demonstrate that scales other than the V.P.I. can discriminate the types.

Testing some hypotheses about types, Holland (1964), used a sample of bright students (360 boys and 278 girls) to complete a questionnaire that included items about their vocational choices, an adjective checklist, self-ratings, and sentence stems about vocations. The data indicated that students classified as different types according to their V.P.I. scores described themselves in terms congruent with Holland's theory.

In a further study, Holland (1968) sampled college freshmen from 28 colleges, with a wide range of academic talent and social status. Students were categorized as types and sub-types according to their V.P.I. profiles and then compared on 22 dependent variables including competencies, life goals, self-ratings, and personality and attitudinal variables. Analysis of variance shows significant differences in comparisons across both types and sub-types. Of particular note is that using theoretically expected high mean scores for types and sub-types, 76% of the predictions are correct for comparisons across types, 75% are correct across two-letter sub-types, and 64% are correct across three-letter sub-types. These statistical tests suggest that people with similar V.P.I. profiles are similar in terms of the dependent variables studied.

Osipow and Wall (1966) show a strong relationship between a student's choice of occupation, his Strong group score, and self-ratings. In a later study, Osipow, Ashby, and Wall (1967), using a sample of 186 male college freshmen, present evidence to support Holland's contention

that each personality type seeks out occupational roles seen as consistent with the perception of self. Students rank ordered descriptions of each personality type according to their perceived resemblance to each. The results were then compared to S.V.I.B. group scores, and indicate that students see themselves in ways that correspond with their interest scores.

More recently, Gross and Gaier (1974) sampled 109 college freshmen to re-examine the previously established relationship between vocational choice and self-ratings. Sampled on the basis of major field of study, the subjects completed a questionnaire to select career stereotypes which described them best. Significant relationships were obtained for four stereotypes (Realistic, Conventional, Enterprising, Artistic) on the basis of both field of study and vocational choice. Three of these relationships (Realistic, Enterprising, Artistic) matched those obtained by Osipow and Wall. As predicted, the sample failed to produce a substantial relationship between self-ratings and vocational choice.

Kelso (1969) correlated the California Psychological Inventory (C.P.I.) and the V.P.I. scales for a sample of 188 college males. His findings indicate that students select courses consistent with their personality traits, and that types tend to have personality traits attributed to them. Folsom (1969) assessed a sample of 1,003 college students with the College Student Questionnaire (C.S.Q.) and then compared student types (defined by their choice of major field) on seven scales of the C.S.Q. The results support the type formulations for all categories except Enterprising. However, Folsom (1971) attempted to replicate Kelso's study by sampling 366 high school students and reports

that the intercorrelation of the C.P.I. and V.P.I. provide little support for the hypothesized attributes of the types.

Using the V.P.I., Lacey (1971) demonstrates that the typology can be extended to working populations. By assessing a sample of 210 men well established in their occupations, V.P.I. profiles were obtained for eight sub-samples of engineers, chemists, computer programmers, high school teachers, actuaries, executives, and college professors and compared with college students interested in the same field. There were no significant differences between the working group and the college group.

In a similar study, Harvey (1971) administered the V.P.I., selected scales of the S.V.I.B., the Edwards Personal Preference Schedule, the Allport-Vernon-Lindzey Study of Values, and the Differential Apptitude Tests to 61 employed women. Moderate relationships were obtained between types and their assumed characteristics, but some inconsistencies were observed.

PERSONALITY CHANGE

Holland's theory has been applied to the person-environment interactions of college students on the notion that personality patterns that are consistent with the intended occupational environment forecast stability of vocational choice and achievement. Holland (1963, 1968) shows that the consistency of a student's personality (according to V.P.I. profile) is positively related to the stability of a student's vocational choice or choice of major field over one- to four-year intervals. The results, however, are generally inconclusive. In

similar studies, Hughes (1971) reports negative results while Kernen (1971) reports inconsistent findings.

Brown (1966) suggests that different kinds of peers provide different kinds of reinforcement. Brown's experiment with students living in a dormitory provides evidence that peers influence a student's tendency to maintain or change vocational goals, dependent on consistency of personality patterns. This study would lead one to believe that the majority type in a population could manipulate types in the minority to either withdraw from an inconsistent environment or change their personality to a pattern congruent with the environment. Holland (1968), however, sampling 2,347 college students at 27 colleges, obtained data which failed to support the hypothesis that students will maintain their vocational choice when surrounded with peers whose choices belong to the same type.

In a further attempt to evaluate the effects of environment upon students, Privateer (1971) examined the effects of a college environment upon entering freshmen. Six hundred freshmen were assessed with the V.P.I. on entry and again in eight months. Results show a student's congruence with his environment was not significantly different over this time period.

Elton (1971), however, provides positive evidence that students who leave a particular environment tend to undergo personality change that makes them different from students who remain in the environment.

Walsh and Lacey (1969, 1970) examined how student personalities

change over a four-year college term by having students estimate how they changed on adjective rating scales. The results suggest that student personalities become more stereotyped over a four-year college program. In a similar study, Walsh, Vaudrin, and Hummel (1972) find that seniors report more change consistent with their personality than freshmen. Taken together, these studies seem to indicate that a college student's personality will become more rigidly stereotyped over a period of time. Thus, the personality pattern of a senior student tends to be more consistent with their occupational stereotype than that of a freshman student.

For the purpose of this study Holland's position that ". . . an increasing differentiation of preferred activities, interests, competencies, and values--create a characteristic disposition or personality type that is predisposed to exhibit characteristic behavior and to develop characteristic personality traits " (Holland, 1973, p. 12) is accepted as a working definition of "personality."

SUMMARY

In general, the review of the literature pertaining to Holland's theory and the Vocational Preference Inventory provides some support for the notion that a person's personality type determines the primary direction of his vocational choice. Moreover, there is evidence that indicates that the personality of students becomes more stereotyped with the type demanded by a particular environment over a period of time.

There are, however, conflicting findings which are sufficiently

convincing to warrant further investigation in both of these areas.

Thus, the present study attempts to answer two questions:

1. Are the personalities of students preparing for a particular occupation consistent with those of the members of the intended occupation?
2. Are there differences in the personality patterns of the student body at various stages of their preparation?

To answer the first question it is assumed that students registered in six programs of study at Grant MacEwan Community College represent Holland's six personality types. It is further assumed that, students registered in the Horsemanship Program are representative of the Realistic Personality Type; Behavioral Science students--Investigative; Nursing students--Social; Secretarial Science students--Conventional; Business Administration students--Enterprising; and Music students--Artistic.

To answer the second question, comparisons of the personality types of students registered in Year I and Year II of the same program of studies are conducted.

CHAPTER III

METHODOLOGY

The design of this study is to classify Grant MacEwan Community College programs of study into Model Environments according to Holland's scheme, and secondly, using the Vocational Preference Inventory protocols of students registered in Years I and II of programs at Grant MacEwan Community College, compare the found and predicted Vocational Preference Inventory outcomes for congruence using analysis of variance and Chi-square analysis of differences.

THE SAMPLE

The sample consisted of 409 male and female students registered in either their first or second year of studies at Grant MacEwan Community College. The students were enrolled in programs of study deemed to be representative of each of Holland's six occupational environments. Random sampling of the members did not occur as every member registered in the six programs was surveyed. The student body of each program was divided into first and second year of studies.

The selection of the programs was based on Holland's Occupational Classification (Holland, 1973) and was verified by Holland in personal correspondence. Table 1 presents the Grant MacEwan Community College programs that were used for the study and the corresponding occupational environments as verified by Holland. N represents the number of students who completed the Vocational Preference Inventory protocol for that program of studies.

TABLE 1

ANALYSIS OF SAMPLE BY OCCUPATIONAL ENVIRONMENT AND GRANT MacEWAN COMMUNITY COLLEGE PROGRAM OF STUDIES

Holland's Occupational Environment	Grant MacEwan Community College Program of Studies	Year I N	Year II N	Total N
Realistic	Horsemanship	22	13	35
Investigative	Behavioral Science	7	5	12
Social	Nursing	64	57	121
Conventional	Secretarial Science	67	34	101
Enterprising	Business Administration	27	32	59
Artistic	Performing Arts (Music)	64	17	81
TOTAL		251	158	409

Grant MacEwan Community College (G.M.C.C.) is a metropolitan, non-resident, tax-tuition supported post-secondary college offering two-year certificate programs. The programs of study are non-technical in nature and usually terminate at a para-professional level of training. Entrance requirements reflect an "open-door policy," requiring either (a) an Alberta Grade XII High School Diploma, or equivalent; or (b) 18 years of age or older and out of school for at least one year. The Registrar's records seemingly reflect the student population of the College as a wide cross-section of the population in terms of age, achievement and socio-economic status.

INSTRUMENTATION AND PROCEDURE

A general questionnaire (Appendix A) on vocational choice was administered at the time of data collection for this study. This

questionnaire and its results do not form part of this study and will not be reported here.

The sole instrument used in this study was the Vocational Preference Inventory (V.P.I.) (Holland, 1965). The V.P.I. was administered to all students registered in the six representative programs of study. Administration of the inventory took place during regularly scheduled classes in a three-week period following commencement of the 1974 academic year. The administration was conducted by the author of the study and followed standardized instructions (Appendix B). Instructors agreed to say nothing to their classes about the study prior to the administration of the instrument. Students who were not in class at the time of administration were contacted by the author and administered the inventory at their convenience.

THE VOCATIONAL PREFERENCE INVENTORY (V.P.I.)

The V.P.I., sixth revision, is a personality and interest inventory composed of 160 occupational titles. To respond, a student indicates which occupations he likes and dislikes. The inventory yields eleven scores: Realistic, Investigative, Social, Conventional, Enterprising, Artistic, Self-control, Masculinity, Status, Infrequency, and Acquiescence. As outlined in Chapter II, the first six scales, representing the personal orientations, were the only scales used in this study.

The V.P.I. has received empirical support for both reliability and validity. The V.P.I. Manual (Holland, 1965) reports reliabilities (Kuder-Richardson 21) ranging from .83 to .89 for 6,289 male college

freshmen and from .76 to .89 for 6,143 females, indicating a high degree of internal consistency. Retest reliability coefficients for Kansas State Freshmen, males and females (N = 26) over a one-year period, are reported as .61 to .86, while coefficients for National Merit Finalists, male (N = 432) and female (N = 204) over a four-year period, range from .47 to .61 and .45 to .56 respectively. The intercorrelations of the Realistic, Investigative, Social, Conventional, Enterprising, and Artistic scales for National Merit Finalists (boys, N = 362; girls, N = 277) is reported as -.08 to .57 and -.03 to .44 respectively. The intercorrelations of the same scales for 103 employed adult males is reported as -.23 to .54. The item -total scale correlation for these same six scales averages .71 and range from .47 to .89.

Studies on the validity of the V.P.I. have presented supporting evidence as well. Haase (1971, p. 182) correlated the six V.P.I. scales and 47 scales of the Strong Vocational Interest Blank (S.V.I.B.) and found ". . . 100% of the trace was extracted by six canonical roots." The six correlations for a sample of 176 male college students ranged from .66 to .86. Haase concludes ". . . the V.P.I. and S.V.I.B. measure similar dimensions." (p. 183) Lee and Hedahl (1972) categorized 432 male college freshmen according to their V.P.I. high-point code and compared them to the Basic Interest (B.I.) scales of the S.V.I.B. They found the B.I. scales discriminated among the types with moderate efficiency. In fact, 21 of the 22 F-tests and 19 of the Scheffé multiple comparisons among the means were significant. These findings receive further support from Cole and Hansen (1971) whose work shows high internal structural relationships of scales from the S.V.I.B. and the V.P.I. Using the V.P.I., S.V.I.B., and the 16PF, Hughes (1971) categorized

working males as types by using their occupations. He tested what characteristics were found for what types and reports the V.P.I. placed 42% of the men in correct occupational categories, the S.V.I.B. placed 14% to 35%, and the 16PF placed 23% correctly. Campbell (1971) created six V.P.I. scales for the S.V.I.B. by using the definitions of the personality types and lists of occupational titles reported by Holland. Rescoring the Strong criterion groups of employed adults for a sample of 76 occupations, the Campbell form of the V.P.I. and the V.P.I. agreed on the main classification of occupation 84% of the time. Campbell apparently feels that the V.P.I. is a creditable instrument in that computerized profiles of the S.V.I.B. now include a listing of the six V.P.I. scales as "General Occupational Themes" (S.V.I.B., Form T399).

Williams (1972) assessed 145 male graduate students, sorted according to Holland's types, by using the V.P.I., 16PF, and the Allport-Vernon-Lindzey Study of Values (A.V.L.). His findings indicate the V.P.I. correctly identified 93 of 145 students, while the 16PF identified 83 of 145, and the A.V.L. 67 of 145. However, in a similar study by Harvey (1971), using the V.P.I., selected scales of the S.V.I.B., the E.P.P.S., the A.V.L. and the D.A.T., he reports moderate relationships between types and their assumed characteristics, but some inconsistencies were observed. Elton and Rose (1970) classified 530 graduating males (University of Kentucky) into Holland's system. Using the Omnibus Personality Inventory as the independent variables and occupational choices according to Holland as the dependent variable, they report correlations of .49 to .87 for the six categories. Folsom (1969) compared student types, as defined by their choice of major field, on seven scales of the College Student Questionnaire. For 1,003 college students,

the results lend support to the type formulations, with the exception of Enterprising. In a later study (Folsom, 1971), 366 high school students were assessed with the V.P.I. and the California Personality Inventory. The intercorrelation provided weak support for the hypothesized attributes of the types. In fact, only 5 of 18 hypotheses were statistically significant.

Finally, Lohnes (in Buros, 1972, p. 387) argues ". . . the V.P.I. is the best choice of an interest inventory for either counselling or research."

SCORING

The individual V.P.I.s were hand scored once by the author and again by an assistant to provide for the best possible accuracy.

ANALYSIS OF DATA

The data collected on each student from the questionnaire and their raw scores on each of the six V.P.I. scales were entered on I.B.M. data cards. Subsequently, computer calculations were performed utilizing a standard one-way analysis of variance and Chi-square tests of differences. The specific statistical analysis used to test each of the questions, and the results, are presented in Chapter IV.

CHAPTER IV

RESULTS

PERSONALITY TYPES AND PROGRAMS OF STUDY

The means and standard deviations for the six groups on each of the V.P.I. variables are reported in Table 2. Results of the analysis of variance for each variable are reported in Table 3.

Inspection of Table 2 indicates that differences significant at the .01 level of confidence exist among the six programs of study on five of the V.P.I. variables: Investigative, Social, Conventional, Enterprising, and Artistic. A significant difference was not found on the Realistic scale.

To determine which programs differed significantly from one another on the variables which reached significance, comparisons were made between all possible pairs of means using the method developed by Scheffé (1959). The results of these tests are reported in Tables 4 to 8. To facilitate the interpretation of between group effects, Cell means also have been plotted graphically in Figures 1 to 6. As a significant difference was not found on the Realistic scale, Figure 1 is presented for information only.

Investigative Scale

Comparisons between the group means on the Investigative scale are reported in Table 4. On this variable, Group I (Horsemanship) and Group V (Business Administration) means differed significantly at

TABLE 2

MEANS AND STANDARD DEVIATIONS FOR GROUPS ON SIX VARIABLES

Group	I		II		III		IV		V		VI	
	Horsemanship (N = 35)		Behavioral Science (N = 12)		Nursing (N = 121)		Secretarial/ Accounting (N = 101)		Business Administration (N = 59)		Music (N = 81)	
Variable	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
Variable 1 (Realistic)	3.57	2.58	3.42	2.27	2.37	2.82	2.84	3.32	2.41	2.48	3.05	3.02
Variable 2 (Investigative)	6.37	3.96	9.17	3.71	4.83	4.01	3.96	4.04	3.59	3.58	4.17	3.89
Variable 3 (Social)	4.69	3.41	9.92	2.91	6.77	3.36	6.15	3.73	5.36	3.86	2.79	3.23
Variable 4 (Conventional)	1.29	2.55	2.08	1.56	1.38	2.13	5.08	3.75	4.31	3.92	0.86	1.83
Variable 5 (Enterprising)	2.77	3.06	3.00	1.41	2.43	2.71	4.37	3.50	5.58	3.52	2.38	2.39
Variable 6 (Artistic)	6.46	3.81	7.58	4.36	5.86	4.27	4.20	4.11	5.51	4.33	8.64	3.49

TABLE 3

ANALYSIS OF VARIANCE RESULTS

Variable	Source of Variance	Sum of Squares (SS)	Mean Square (MS)	Degrees of Freedom (DF)	F-Ratio (F)
1 (Realistic)	Between	61.26	12.25	5.	1.44
	Within	3421.26	8.49	403.	
2 (Investigative)	Between	481.66	96.34	5.	6.26*
	Within	6196.86	15.38	403.	
3 (Social)	Between	1089.95	217.99	5.	17.79*
	Within	4937.72	12.25	403.	
4 (Conventional)	Between	1279.80	255.96	5.	30.72*
	Within	3357.96	8.33	403.	
5 (Enterprising)	Between	587.23	117.45	5.	13.06*
	Within	3622.82	8.99	403.	
6 (Artistic)	Between	946.30	189.26	5.	11.48*
	Within	6641.63	16.48	403.	

* $p < .01$

FIGURE 1

MEAN REALISTIC SCORES FOR EACH GROUP

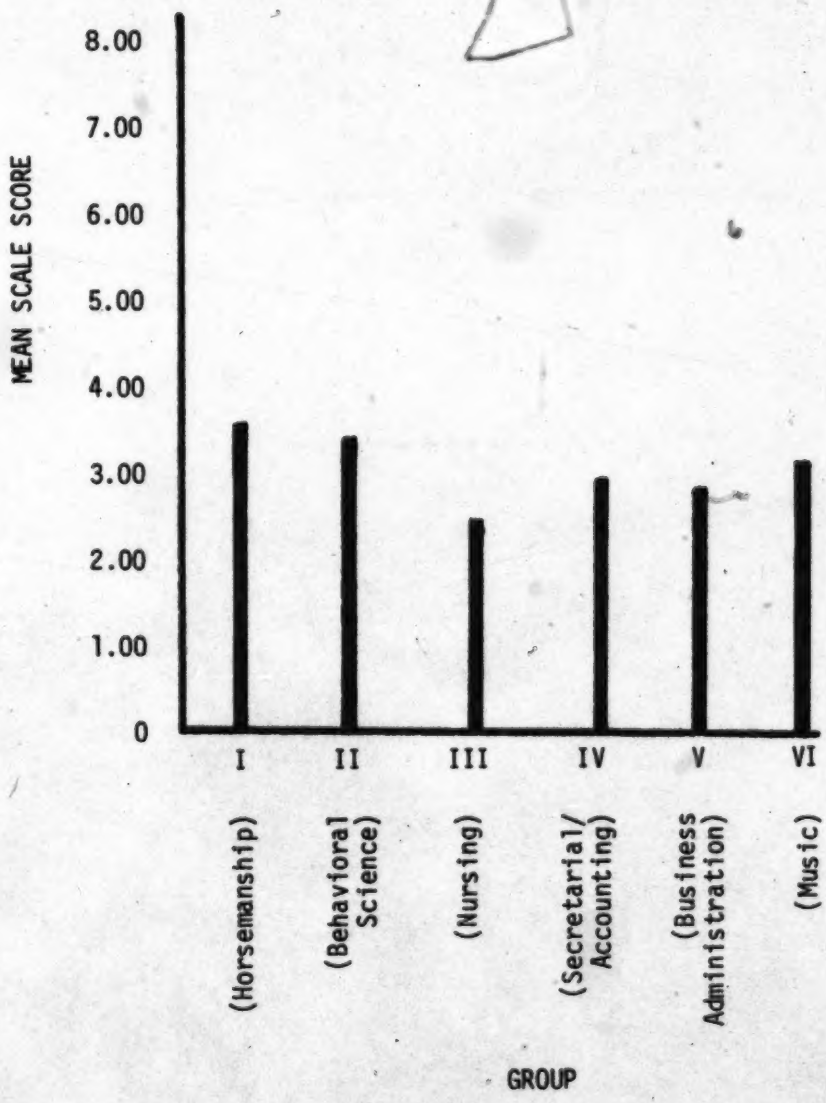


TABLE 4

MULTIPLE COMPARISONS FOLLOWING A SIGNIFICANT F-RATIO
VARIABLE II (INVESTIGATIVE)

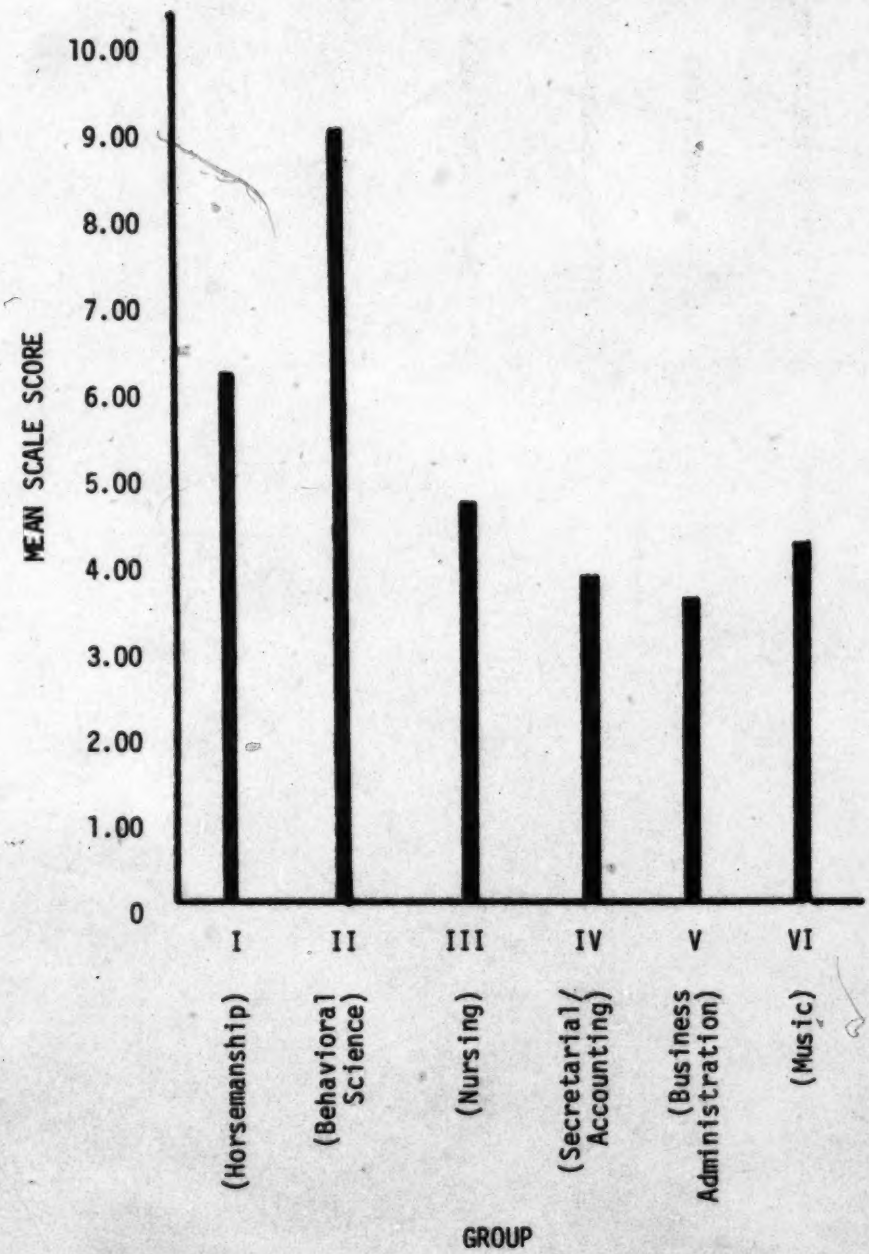
Group Comparison	Mean Difference	p
I - II	2.80	0.48
I - III	1.54	0.52
I - IV	2.41	0.08
I - V	2.78	0.05**
I - VI	2.20	0.18
II - III	4.34	0.02**
II - IV	5.21	0.01*
II - V	5.58	0.01*
II - VI	5.00	0.01*
III - IV	0.87	0.75
III - V	1.24	0.56
III - VI	0.66	0.93
IV - V	0.37	1.00
IV - VI	0.21	1.00
V - VI	0.58	0.98

* $p < .01$

** $p < .05$

FIGURE 2

MEAN INVESTIGATIVE SCORES FOR EACH GROUP



the .05 level of confidence. As well, Group II (Behavioral Science) differed from Group III (Nursing) at the .05 level. Group II (Behavioral Science) differed significantly from Groups IV (Secretarial Science), V (Business Administration), and VI (Music) at the .01 level of confidence.

Inspection of Table 2 and Figure 2 reveals that the mean scale score for Horsemanship students is greater than the mean scale score for Business Administration students. As well, it can be seen that the mean scale score for Behavioral Science students is greater than that of Nursing, Secretarial Science, Business Administration and Music students.

It appears, therefore, that Horsemanship students exhibit a more Investigative Personality than the Business Administration students. In addition, it appears that Behavioral Science students are more Investigative than Nursing, Secretarial Science, Business Administration, and Music students.

Social Scale

Comparisons between the group means on the Social scale are reported in Table 5. On this variable, Group II (Behavioral Science) and Group IV (Secretarial Science) means differed significantly at the .05 level of confidence. Group II (Behavioral Science) differed significantly from Group I (Horsemanship), Group V (Business Administration), and Group VI (Music) at the .01 level. As well, Group VI (Music) differed significantly from Groups III (Nursing), IV (Secretarial Science), and V (Business Administration) at the .01 level.

TABLE 5

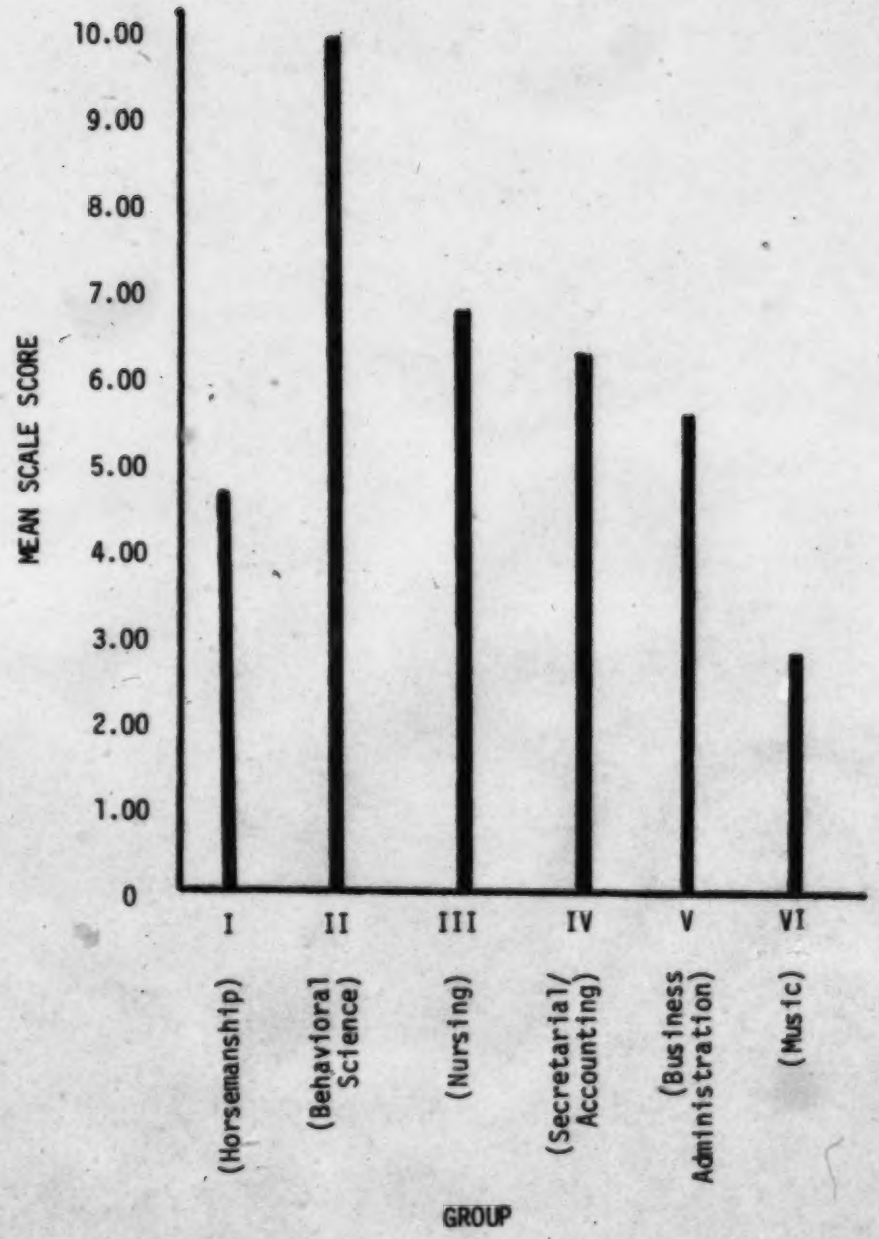
MULTIPLE COMPARISONS FOLLOWING A SIGNFICANT F-RATIO
VARIABLE III (SOCIAL)

Group Comparison	Mean Difference	p
I - II	5.23	0.01*
I - III	2.08	0.09
I - IV	1.46	0.48
I - V	0.67	0.98
I - VI	1.90	0.21
II - III	3.15	0.12
II - IV	3.77	0.03**
II - V	4.56	0.01*
II - VI	7.13	0.01*
III - IV	0.62	0.89
III - V	1.41	0.27
III - VI	3.98	0.01*
IV - V	0.79	0.86
IV - VI	3.36	0.01*
V - VI	2.57	0.01*

* $p < .01$
** $p < .05$

FIGURE 3

MEAN SOCIAL SCORES FOR EACH GROUP



Inspection of Table 2 and Figure 3 reveals that the mean scale score for Behavioral Science students is greater than the mean scale score for Secretarial Science students. As well, it can be seen that the mean scale score for Behavioral Science students is greater than that of Horsemanship, Business Administration, and Music students. Also, Nursing students had a higher mean scale score than that of Music students.

It appears, therefore, that Behavioral Science students exhibit a more Social Personality than the Horsemanship, Secretarial Science, Business Administration, and Music students. The Nursing students are more Social than Secretarial Science Students. Further, the Secretarial Science students are more Social than the Music students.

Of particular note, is that the Nursing students do not have a higher mean Social score than all other groups, as Holland's theory predicts.

Conventional Scale

Comparisons between the group means on the Conventional Scale are reported in Table 6. On this variable, Group II (Behavioral Science) and Group IV (Secretarial Science) means differed significantly at the .05 level of confidence. Group I (Horsemanship) differed significantly from Groups IV (Secretarial Science) and V (Business Administration) at the .01 level. As well, Group III (Nursing) differed significantly from Groups IV (Secretarial Science) and V (Business Administration); and, Group VI (Music) differed significantly from Groups IV (Secretarial Science) and V (Business Administration) at the .01 level.

TABLE 6

MULTIPLE COMPARISONS FOLLOWING A SIGNFICANT F-RATIO
VARIABLE IV (CONVENTIONAL)

Group Comparison	Mean Difference	p
I - II	0.79	0.98
I - III	0.09	1.00
I - IV	3.79	0.01*
I - V	3.02	0.01*
I - VI	0.43	0.99
II - III	0.70	0.99
II - IV	3.00	0.04**
II - V	2.23	0.32
II - VI	1.22	0.87
III - IV	3.70	0.01*
III - V	2.93	0.01*
III - VI	0.52	0.91
IV - V	0.77	0.75
IV - VI	4.22	0.01*
V - VI	3.45	0.01*

* $p < .01$
** $p < .05$

FIGURE 4

MEAN CONVENTIONAL SCORES FOR EACH GROUP

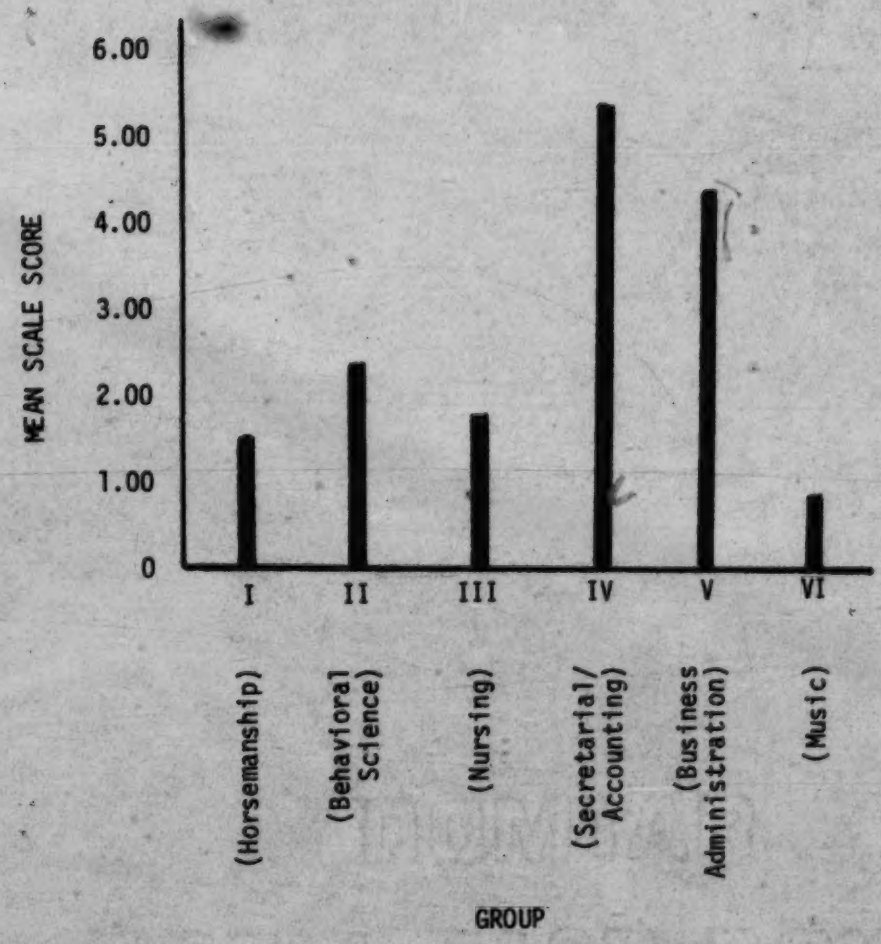


Table 2 and Figure 4 reveal that the mean scale score for Secretarial Science students is greater than that of Horsemanship, Behavioral Science, Nursing, Business Administration, and Music students. As well, the mean scale score for Business Administration students is greater than that of Horsemanship, Nursing, and Music students.

It would appear that Secretarial Science students exhibit a more Conventional Personality than Horsemanship, Behavioral Science, Nursing, Business Administration, and Music students. Further, it appears that Business Administration students are more Conventional than Horsemanship, Nursing, and Music students.

Enterprising Scale

Comparisons between the group means on the Enterprising scale are reported in Table 7. On this variable, Group I (Horsemanship) and Group V (Business Administration) means differed significantly at the .01 level of confidence. As well, Group III (Nursing) differed significantly from Groups IV (Secretarial Science) and V (Business Administration) at the .01 level. Group VI (Music) differed significantly from Groups IV (Secretarial Science) and V (Business Administration), also at the .01 level.

Table 2 and Figure 5 reveal that the mean scale score for Business Administration is greater than that of Horsemanship, Secretarial Science, Nursing, and Music students. It can also be seen that the mean scale score for Secretarial Science students is greater than that of Nursing students and Music students.

It appears that Business Administration students exhibit a

TABLE 7

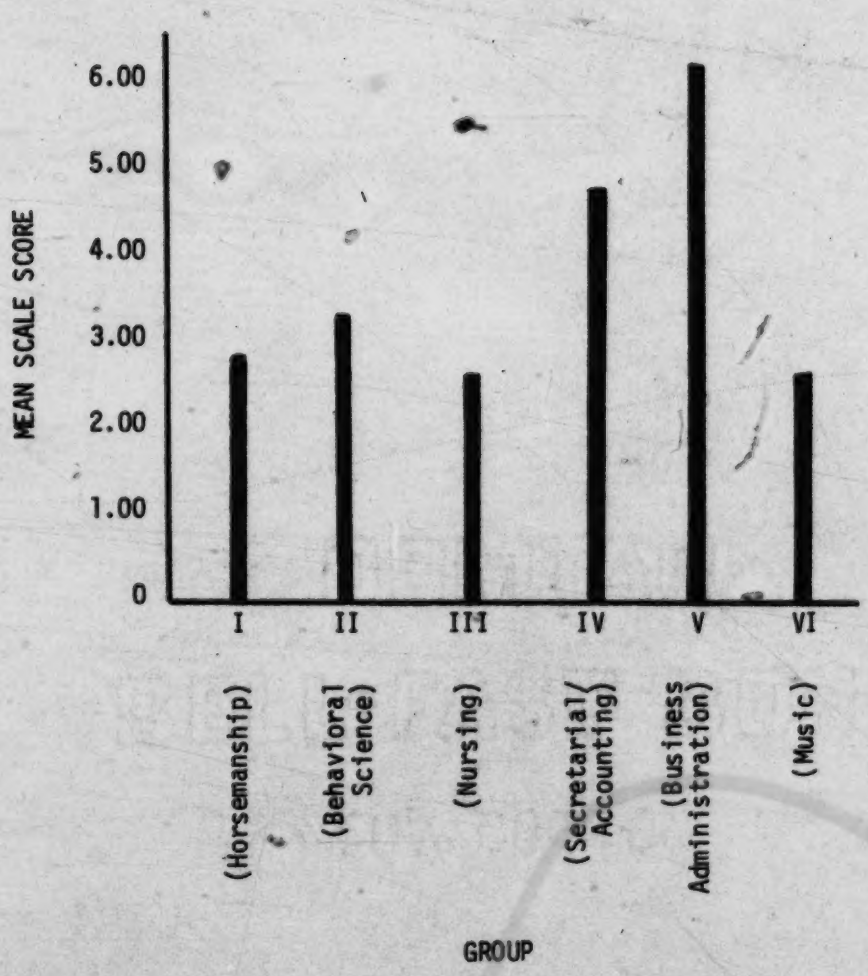
MULTIPLE COMPARISONS FOLLOWING A SIGNIFICANT F-RATIO
VARIABLE V (ENTERPRISING)

Group Comparison	Mean Difference	p
I - II	0.23	1.00
I - III	0.34	1.00
I - IV	1.60	0.20
I - V	2.81	0.01*
I - VI	0.39	1.00
II - III	0.57	1.00
II - IV	1.37	0.82
II - V	2.58	0.20
II - VI	0.62	1.00
III - IV	1.94	0.01*
III - V	3.15	0.01*
III - VI	0.05	1.00
IV - V	1.21	0.30
IV - VI	2.09	0.01*
V - VI	3.20	0.01*

* $p < .01$

FIGURE 5

MEAN ENTERPRISING SCORES FOR EACH GROUP



more Enterprising Personality than the Horsemanship, Secretarial Science, Nursing, and Music students. As well, Secretarial Science students are more Enterprising than Nursing and Music students.

Artistic Scale

Comparisons between the group means on the Artistic scale are reported in Table 8. On this variable, Group VI (Music) and Groups III (Nursing), IV (Secretarial Science), and V (Business Administration) means differ significantly at the .01 level of confidence.

Inspection of Table 2 and Figure 6 reveals that the mean scale score for Music students is greater than the mean scale score for Nursing, Secretarial Science, and Business Administration students.

It appears, therefore, that Music students exhibit a more Artistic Personality than the Nursing, Secretarial Science, and Business Administration students.

PERSONALITY PATTERNS AND STAGES OF PREPARATION

On the basis of the findings reported above, it was generally supported, with the exception of Nursing, that students in the same program of studies have V.P.I. scores similar to members of their intended occupations. Therefore, students registered in the programs representative of Holland's six Occupational Environments, were sub-divided into Year I and Year II of studies, and categorized as having the appropriate Personality Type or not having the appropriate type on the basis of their high-point V.P.I. score. A Chi-square analysis, utilizing Yates's correction for continuity was performed to test for differences between students in Year I and students in Year II, of

TABLE 8

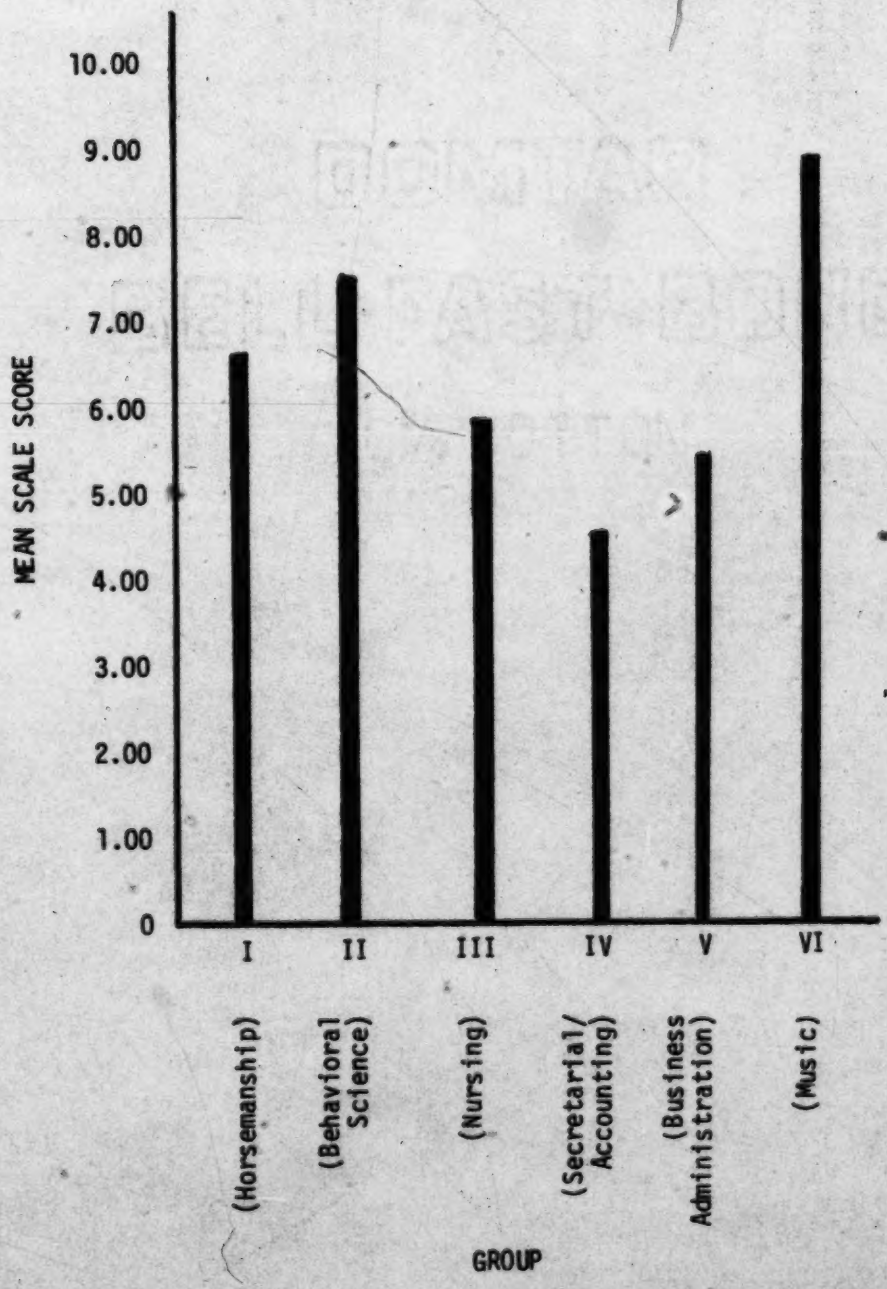
MULTIPLE COMPARISONS FOLLOWING A SIGNIFICANT F-RATIO
VARIABLE VI (ARTISTIC)

Group Comparison	Mean Difference	p
I - II	1.12	0.98
I - III	0.60	0.99
I - IV	2.26	0.16
I - V	0.95	0.94
I - VI	2.18	0.22
II - III	1.72	0.85
II - IV	3.38	0.19
II - V	2.07	0.76
II - VI	1.06	0.98
III - IV	1.66	0.10
III - V	0.35	1.00
III - VI	2.78	0.01*
IV - V	1.31	0.57
IV - VI	4.44	0.01*
V - VI	3.13	0.01*

* $p < .01$

FIGURE 6

MEAN ARTISTIC SCORES FOR EACH GROUP



their respective program of studies, and whether or not their observed V.P.I. high-point score was consistent with the expected score, as predicted by Holland. It was decided to use Yates's correction as Ferguson (1971, p. 188) states that ". . . for small expected values of N the continuous normal curve is a poor fit to the discrete binomial." It is suggested by Ferguson that the correction should always be used, but most certainly when the expected frequencies are less than 5. For consistency, the Yates's correction was used in all Chi-square calculations. Table 9 presents the representative programs of study, the number of students with observed high-point scores consistent and not consistent with the expected scores, and the Chi-square quotient.

Inspection of Table 9 reveals that only one group of students, Secretarial Science, showed a significant difference on the criterion.

TABLE 9

CHI-SQUARE ANALYSIS

Representative Program		Year I	Year II	x^2
Horsemanship:				
	Consistent	1	2	2.99
	Not Consistent	21	11	
Behavioral Science:				
	Consistent	4	3	.48
	Not Consistent	3	2	
Nursing:				
	Consistent	33	29	.011
	Not Consistent	31	28	
Secretarial Science:				
	Consistent	22	27	21.49*
	Not Consistent	45	7	
Business Administration:				
	Consistent	5	10	.03
	Not Consistent	22	22	
Music:				
	Consistent	53	14	.10
	Not Consistent	11	3	

* $p < .01$

CHAPTER V

CONCLUSIONS AND IMPLICATIONS

In this chapter, the research findings will be discussed in relation to the two questions raised at the beginning of the study. Implications and further research will be suggested where appropriate.

LIMITATIONS AND DELIMITATIONS

1. The findings are relevant to Holland's theory as operationalized through the research questions.
2. The population consists of students registered in six programs of study at Grant MacEwan Community College which lead to specified occupations.
3. The sample studied is the population.

ASSUMPTIONS

1. It is assumed that the students who have registered for a program of studies at Grant MacEwan Community College have narrowed their vocational choices to the alternative outlined by the program description offered by Grant MacEwan Community College.
2. It is assumed that each Grant MacEwan Community College program description reflects the sorts of tasks to be encountered by the registrant and prospective career entrant.

3. It is assumed that Holland's Classifications hold for G.M.C.C. programs of study.

PERSONALITIES AND PROGRAMS OF STUDY

The results of the analysis of the data generally supported the research position that students preparing for a particular occupation have personalities consistent with the members of the intended occupation. It was found that the students in five of six programs of study at Grant MacEwan Community College had the Personality Types consistent with that of the Occupational Environments predicted by Holland's theory. The exception to these findings was that of the Nursing students (Social Type). In view of the consistent findings for the other five groups, one might speculate that the Nursing students sampled in this study have made an incorrect vocational choice, according to Holland, in that their Personality Type is inconsistent with their Occupational Environment. Although this is possible, it would seem improbable that the majority of the students would find themselves in this predicament. It is, however, possible that the personality of Nursing students registered in a two-year college program differs from that of students registered in a hospital-based program, a university program, or a program of greater length.

The possibility that the stereotype of the specific occupation may change due to a change of the typical Personality Type of the members of the Model Environment cannot be excluded. This would result in an inaccurate stereotype image of the occupation by prospective occupational entrants. In that a great portion of the Nursing students sampled in this study scored highest on the Investigative scale rather

than the predicted Social scale, this explanation would seem appropriate. Consequently, it would appear necessary to continuously evaluate stereotypes of model environments and revise the theory if environments are found changed to another classification.

PERSONALITY CHANGE

The results of this study offer little support for the stance that the student body of a particular program would have a personality pattern more consistent with the members of the intended Occupational Environment as the length of time spent in the program increases. These findings would seem to support the earlier study reported by Privateer (1971). It is possible that this suggested change was not found due to the length of the college term studied. In other words, this phenomena may exist over a longer period of time than two years. This possibility would seem to be consistent with the findings of Walsh and Lacey (1969, 1970) and Walsh, Vaudrin, and Hummel (1972) who utilized a four-year period of time.

IMPLICATIONS

Holland makes the point that a Personality Type who has an incongruent Model Environment, for example, an Artistic Type in a Conventional Environment, will likely withdraw from the environment and search out a "better" choice. This could be tested for at Grant MacEwan Community College by classifying an Environment through Holland's theory, confirming the classification via the V.P.I. or S.V.I.B., thence determining which individuals have a Personality Type profile at odds with the type demanded by the Environment. Accordingly, it should be found

that these individuals change programs of study or drop out of the program with greater frequency than those whose Personality Type is congruent with the Environment.

By the same measure, it should be found that the most successful members of a particular program have a Personality Type profile congruent with the profile demanded by the classification of the program.

CONCLUSIONS

Upon the evidence of this study, vocational counsellors at Grant MacEwan Community College may find it useful to use a student's V.P.I. profile to enable the student and counsellor to gather relevant hints of personality correlates which may aid a vocationally unsure student to clarify himself vis-a-vis specific vocations.

Further, counsellors may find it useful to organize occupational information, including Institute Calendars, brochures, and job opportunities, according to Holland's six orientations. This type of classification system would provide for a simple method of organizing occupational information, from numerous areas, into an easily comprehensible and accessible vocational library.

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APPENDIX A

NAME: _____ STUDENT IDENTIFICATION #: _____

SEX: Male ___ Female ___ AGE: ____

PROGRAM OF STUDIES: _____

TRIMESTER OF STUDIES: 1 ___ 2 ___ 3 ___ 4 ___

1. Have you ever consulted a Vocational Counsellor with regards to your vocational choice or career planning?

   Yes ___ No ___

2. Was this contact in:

   Junior High School ___
   Senior High School ___
   G.M.C.C. ___
   Canada Manpower ___
   Other (Specify) _____

3. Did this counselling have any affect on your decision to enter your present program of studies?

   Considerable Effect ___
   Some Effect ___
   Little Effect ___
   No Effect ___

4. On the following scale, circle the number that you feel best describes how certain (ie., positive, sure) or uncertain (ie., unsure, undecided) you are at the present time that your program is a reflection of your desired vocational goal.

VERY UNCERTAIN	UNCERTAIN	NOT SURE	CERTAIN	VERY CERTAIN
1	2	3	4	5

APPENDIX B

INSTRUCTIONS

I am conducting a study that examines the vocational preferences of students enrolled at Grant MacEwan Community College. In order to do this, I am asking that you assist me by taking a few minutes to answer some questions relevant to vocational choice. This should not take us longer than fifteen minutes.

I am not interested in your individual answers but I am interested in how you answer as a group, thus, you need not worry that you will be able to be identified in the study. All materials will be coded by me and placed on computer cards. If you wish an individual assessment, we can arrange to meet at a later time.

Now, if you would turn your attention to this (show) single sheet questionnaire. Write your name, student I.D.#, sex, age, program of studies, and trimester of studies in the appropriate area. Now, would you please read questions 1 to 4 and answer each according to your own experiences. If you have any questions, please raise your hand.

Now, turn your attention to the page marked The Vocational Preference Inventory (show) and the corresponding answer sheet (show). Please do not mark the Inventory sheet (show) in any way as it will be used again. On the answer sheet (show) write in your name, program of studies, trimester of study, and the date. This inventory consists of 160 occupational titles and is an inventory of your feelings and attitudes about kinds of work. You are to read through the titles and blacken the corresponding answer Y for Yes if the occupation <u>interests</u> you or <u>appeals</u> to you, or, N for No if you <u>dislike</u> or are <u>uninterested</u> in the title of work. If you are undecided about the occupation, do not mark either Y or N--leave it blank. First impressions are likely the best, so do not spend a great deal of time on any one title.

Please check to see that your name, I.D.#, and program of studies appears on both the answer sheet and the questionnaire.

--Collect materials.

--Thank students for participating in the study.